



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,133	11/13/2003	Mahmoud H. Abd Elhamid	8540G-000228	8183
27572	7590	05/30/2006		EXAMINER
		HARNESS, DICKEY & PIERCE, P.L.C.		KALAFUT, STEPHEN J
		P.O. BOX 828		
		BLOOMFIELD HILLS, MI 48303		
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

CW

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/712,133	ELHAMID ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Stephen J. Kalafut	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 November 2003 is/are: a) accepted or b) objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There are no antecedents in this claim or its parent claim 1 for “the remaining first fuel” and “the remaining second fuel”. Neither any fuel nor numbering thereof is previously mentioned in these claims.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 4, 9 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Fredette (US 6,991,864).

Fredette discloses a fuel cell stack (151), and its method of operation, in which energy generated during shutdown is stored in an energy storage device, such as a battery (213), associated with the stack (column 2, lines 61-65). This energy would be available for later use. The fuel cell stack is also associated with a controller (185). The electricity produced during shutdown would be generated by the reactants remaining within the fuel cell, which would be the fuel and oxidant, or the “first fuel” and “second fuel”, to the extent these terms are understood.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 7, 10, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fredette in view of Reiser *et al.* (US 6,858,336).

While Fredette discloses fuel valves upstream (180) and downstream (181) from the fuel cell, and an air valve (166) downstream from the fuel cell, he does not disclose an upstream air valve. Fredette also does not disclose the purging of his fuel cell with air. Reiser *et al.* disclose a fuel cell system (100) that includes an air valve (158) upstream from the cathode (116). This enables air to be diverted to the anode in a purging operation during shutdown (column 2, lines 42-48). Air may also be sent to the cathode during this operation (column 6, lines 24-25). Because this purging operation is part of a shutdown procedure, it would be beneficial used with other shutdown operations. Because the purge operation of Reiser *et al.* occurs quickly, thus minimizing the chance for corrosion at the catalyst (column 3, lines 48-59), it would be obvious to use the purge operation of Reiser *et al.*, with the valve arrangement that enables it, in the fuel cell system of Fredette.

Claims 5, 8, 11, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fredette in view of Stühler *et al.* (US 6,612,385).

Fredette discloses an air blower (174), which would also be a type of compressor, used to move air into his fuel cell system, but does not teach that the blower is powered by the energy storage device (213) associated with the fuel cell. Stühler *et al.* disclose a compressor (2) that inputs air into a fuel cell stack (1), which is driven, part of the time, by a motor powered by a battery (column 1, lines 48-55). Because the fuel cell of Fredette would produce a smaller amount of power during startup or shutdown than during normal operation, it would be obvious to drive his air blower with a motor powered by his battery, as taught by Stühler *et al.* Regarding claim 13, the air blower would be a “component of the fuel cell system”.

Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fredette in view of Edlund *et al.* (US 6,811,908).

These claims differ from Fredette by reciting a resistance heater coupled to the fuel cell stack, and powered by the energy storage device. Edlund *et al.* disclose a fuel cell stack (14) that includes a resistance heater (104) that receives current from a power source, such as the stack itself or from a battery that stores energy from the stack (column 7, lines 58-62). Because this would enable the fuel cell stack to be heated during startup, it would be obvious to use the resistance heater of Edlund *et al.* in the fuel cell stack of Fredette.

Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fredette in view of Reiser *et al.* as applied to claim 16 above, and further in view of Stühler *et al.*

The above combination does not teach the use of power from the energy storage device used to drive a motor and in turn a compressor or blower. This is disclosed by Stühler *et al.*

(column 1, lines 48-55). Because the fuel cell of Fredette, modified as stated above in view of Reiser *et al.*, would produce a smaller amount of power during startup or shutdown than during normal operation, it would be obvious to drive his air blower with a motor powered by his battery, as taught by Stühler *et al.* Regarding claim 19, the air blower would be a “component of the fuel cell system”.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fredette in view of Reiser *et al.* as applied to claim 16 above, and further in view of Edlund *et al.*

The above combination does not teach a resistance heater coupled to the fuel cell stack, and powered by the energy storage device. This is disclosed by Edlund *et al.* (column 7, lines 58-62). Because this would enable the fuel cell stack to be heated during startup, it would be obvious to use the resistance heater of Edlund *et al.* in the fuel cell stack of Fredette, , modified as stated above in view of Reiser *et al.*

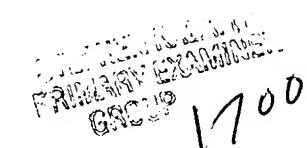
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Margiott *et al.* (US 2003/0087138) disclose a fuel cell shutdown procedure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

sjk

  
  
1700